

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1-2. (Canceled)

3. (Currently amended): A method of manufacturing a small rare earth permanent magnet comprising the steps of:

forming a cylindrical or disc-shaped rare earth magnet with a hole forming an inner surface, wherein the magnet has a surface to volume ratio of 2 mm^{-1} or more and a volume of 100 mm^3 or less, the forming step including a step of applying mechanical processing to a sintered Nd-Fe-B system or Pr-Fe-B system rare earth magnet block material so as to damage the surface of the magnet and to cause a magnetic characteristic $(BH)_{\max}$ of the magnet to deteriorate,

inserting an electrode wire into the hole of the cylindrical or disc-shaped magnet,

supporting the magnet on the electrode wire in a depressurized tank,

placing the electrode wire between oppositely-disposed targets in the tank, wherein the oppositely-disposed targets are ring-shaped targets disposed concentrically with respect to the center axis of the cylindrical or disc-shaped magnet, the electrode wire extending and being fixed on a rotation shaft of a motor located outside of one of the ring-shaped targets.

reverse-sputtering the magnet while the magnet is made to be electrically negative through the electrode wire,

transforming an R metal (R denotes at least one kind of rare earth elements selected from the group consisting of Y, Nd, Dy, Pr, Ho and Tb) or an alloy containing an R metal into fine particles by a sputtering method,

rotating the magnet with the electrode wire as a rotation shaft,

allowing the fine particles to fly three-dimensionally and deposit to form uniform film onto the whole or part of the surface of the magnet,

allowing the film to diffuse and permeate from the surface of the magnet to the inside of the magnet to at least a depth corresponding to a radius of a grain exposed on the outermost surface of the magnet, and thereby ~~improving the quality of~~ modifying the damaged magnet surface ~~a portion~~ so that the magnetic characteristic $(BH)_{max}$ is recovered to 280 kJ/m³ or more.

4. (Previously presented): A method of manufacturing a rare earth permanent magnet as set forth in claim 3, wherein the step of allowing the fine particles to fly and deposit is carried out at the same time as the step of allowing the film to diffuse and permeate the magnet.

5-10. (Canceled)

11. (Previously presented): A method of manufacturing a rare earth permanent magnet as set forth in claim 3, wherein the step of allowing the film to diffuse and permeate the magnet is effected while a concentration of impurity gases from the air contained in the ambient atmosphere is reduced to 50 ppm or less.

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12. (Previously presented): A method of manufacturing a rare earth permanent magnet as set forth in claim 3, wherein the R metal is Dy or Tb.

13-16. (Canceled)